PUBLIC HEALTH DIVISION
Drinking Water Services
Kate Brown, Governor

Oregon Health Authority

800 NE Oregon Street, Ste 640
Portland, OR 97232
Phone: (971) 673-0405
Fax: (971) 673-0694
www.healthoregon.org/DWP

January 9, 2020

Ed Hodges, PE
Curran-McLeod, Inc.
6655 S.W. Hampton St., Suite 210
Portland, OR 97223

Re: **Falcon Cove Beach Water District (PWS #00045) – New Well L132105**
Curran-McLeod Project # 1530
Conditional Approval (PR #77-2019). SRF SD# 19-242

Dear Mr. Hodges:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the new well on behalf of the Falcon Cove Beach Water District.

On May 6, 2019, our office received a site map showing the location of a new well proposed for the District and a preliminary water well construction diagram. A plan review fee of $825 and Land Use Compatibility Statement (LUCS) was received on May 6, 2019.

On January 7th - 8th , 2020 we received the plans showing how the well is to be connected to the system, revised lease agreement with OPRD indicating hazards will be prohibited within 100-ft of the well, approved waiver of the Geologic Hazard Overlay provisions issued by Clatsop County, and LUCS approved by Clatsop County. IOC and VOC results were also submitted.

SRF funds under SD# 19-242 are being used for the wellhouse, yard piping, residual disinfection system, and related appurtenances for which a Categorical Exclusion from further environmental review was granted on January 7, 2020.

The well is to be designated SRC-CA Well #1 (L132105) on its own entry point "C" (EP-C). Please ensure raw water sampling results indicate the sample location as "SRC-CA Well #1". Please ensure any treated water sampling representative of water entering the distribution system from this well is marked as having been taken at "EP-C Well #1".

The project is approved provided the following conditions are met:

Nikki Hendricks
Watermaster, Dist. 1
Oregon Water Resources Department
4000 Blimp Blvd. Suite 400
Tillamook, OR 97141
Phone: 503-815-1967
Fax: 503-815-1968
Email: Nikki.M.Hendricks@oregon.gov

1) Evidence of the applicable water rights required by the Water Resources Department is submitted – contact Nikki Hendricks with OWRD for further assistance with this.
2) Information that demonstrates how the water system meets OAR 333-061-0050(5)(e): "Provisions shall be made to alert the water supplier before the chlorine supply is exhausted." This requirement can be satisfied by either installing a low-level chorine alarm or by creating a written procedure to check the chlorine tank daily.
3) A raw water sample tap (prior to chlorine injection) is installed (both raw and treated water sample taps are needed);
4) The chlorine product being used demonstrates it meets NSF Standard 60;
5) Testing equipment is provided to determine the chlorine residual. The equipment must be a DPD-test kit or other EPA approved method of testing.
6) Test results for SOC, Uranium, Radium 226/228, Gross Alpha, and coliform bacteria (presence/absence) are submitted (VOC and IOC results from sampling completed 3/6/19 was submitted on 1/7/20). As required of the spring sources, annual raw water source sampling for coliform bacteria taken from a sample tap at the wellhead and prior to chlorine injection will be an on-going sampling requirement. Subsequent monitoring will depend upon the results of initial monitoring and will generally be as shown in table 1 below.

   IOC and VOC Test results from sampling completed 3/6/19 showed the following detections:

   - Barium = 0.0341 mg/l (MCL = 2 mg/l)
   - Iron = 0.066 mg/l (secondary standard = 0.3 mg/l)
   - Magnesium = 14.3 mg/l
   - Sodium = 32.1 mg/l (secondary standard = 20 mg/l)
   - Fluoride = 0.11 mg/l (MCL = 10 mg/l)
   - pH = 6.6 (secondary standard = 8.5. pH less than 7.0 is corrosive)

Please note that approval for use of this well is not granted until a "Final Approval" letter has been issued.

Table 1 – Initial monitoring				Year 2	Year 3
Year 1					
Sampling to be completed prior to Final Approval	Sample by the end of the first quarter of operation (after Final Approval)	2nd Quarter of Operation	3rd Quarter of operation		
Sample at the Source (SRC-CA)	Sample at the Entry Point (EP-C) to the distribution system served by the new source				
• Coliform • Nitrate, Nitrite • IOC, VOC, SOC • Arsenic • Radiological including uranium, gross alpha, and radium 226/228	• Radiological	• Radiological if detects	• Radiological if detects	Annual: • Nitrate • VOC • SOC • Raw water coliform (pre-treatment)	
Sampling at Customer Taps	Tap Sampling in the Distribution System (to assess impact of the new well on distribution system corrosion).				
• Lead and Copper	• Sample at 10 Tier 1 sites (1st 6-months of operation)		• Sample at 10 Tier 1 sites (second 6 months of operation)	Reduction to 5 tap samples every 3 years is possible depending upon results	

Documentation and test results submitted to address the above-mentioned items should reference Plan Review #77-2019 and can be emailed to me at evan.e.hofeld@state.or.us or mailed to: Attn: Evan Hofeld
OHA-Oregon Drinking Water Program
PO BOX 14450
Portland, OR 97293-0450

If you have any questions, please feel free to call me at 971-673-0419.

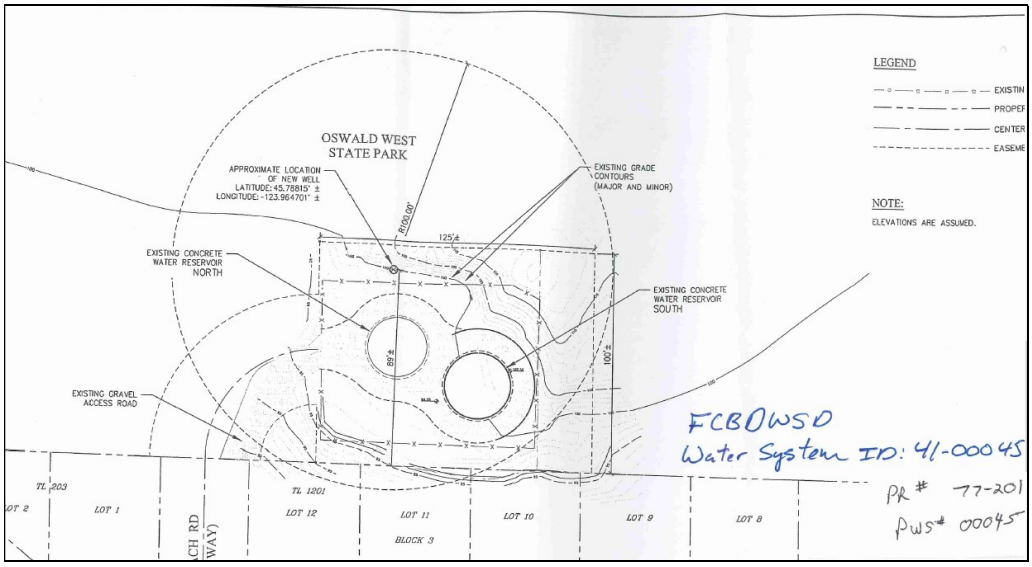
Sincerely,

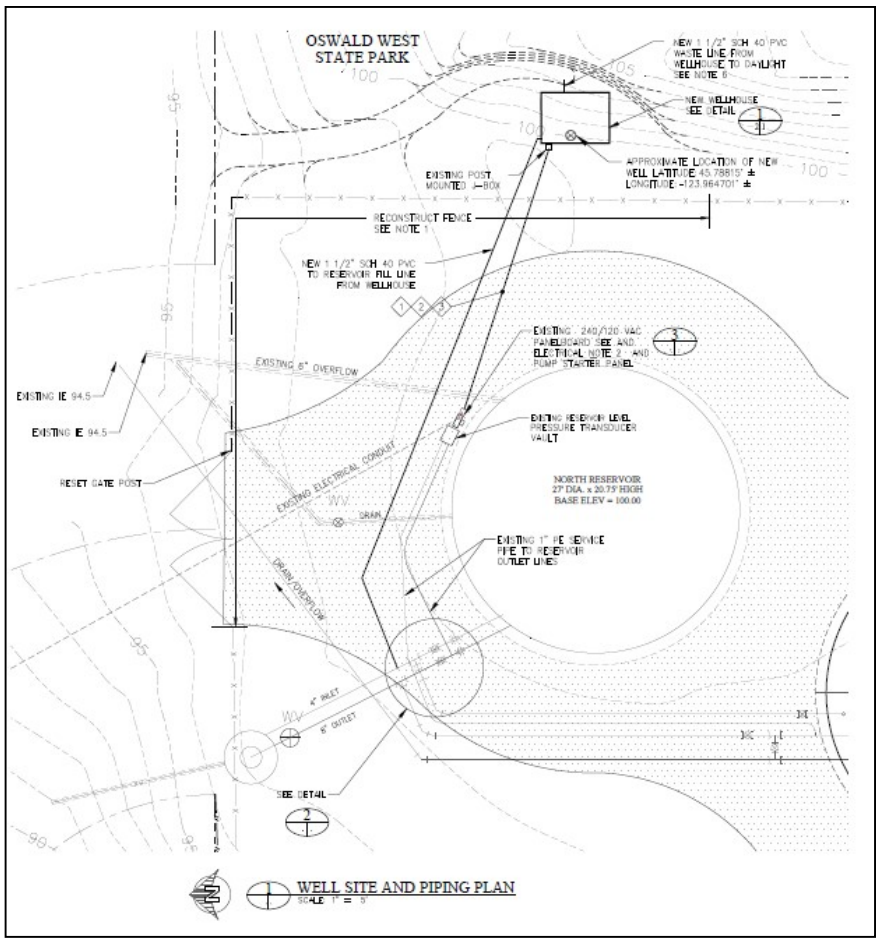
Evan Hofeld, PE
Oregon Health Authority – Drinking Water Services

CC: Charles Dice, Falcon Cove Beach Water District
Annette Pampush, Tillamook County Environmental Health
Gail Henrikson, Clatsop County Community Development
Nikki Hendricks, Oregon Water Resources Department
Alice Beals, Oregon Parks and Recreation Department

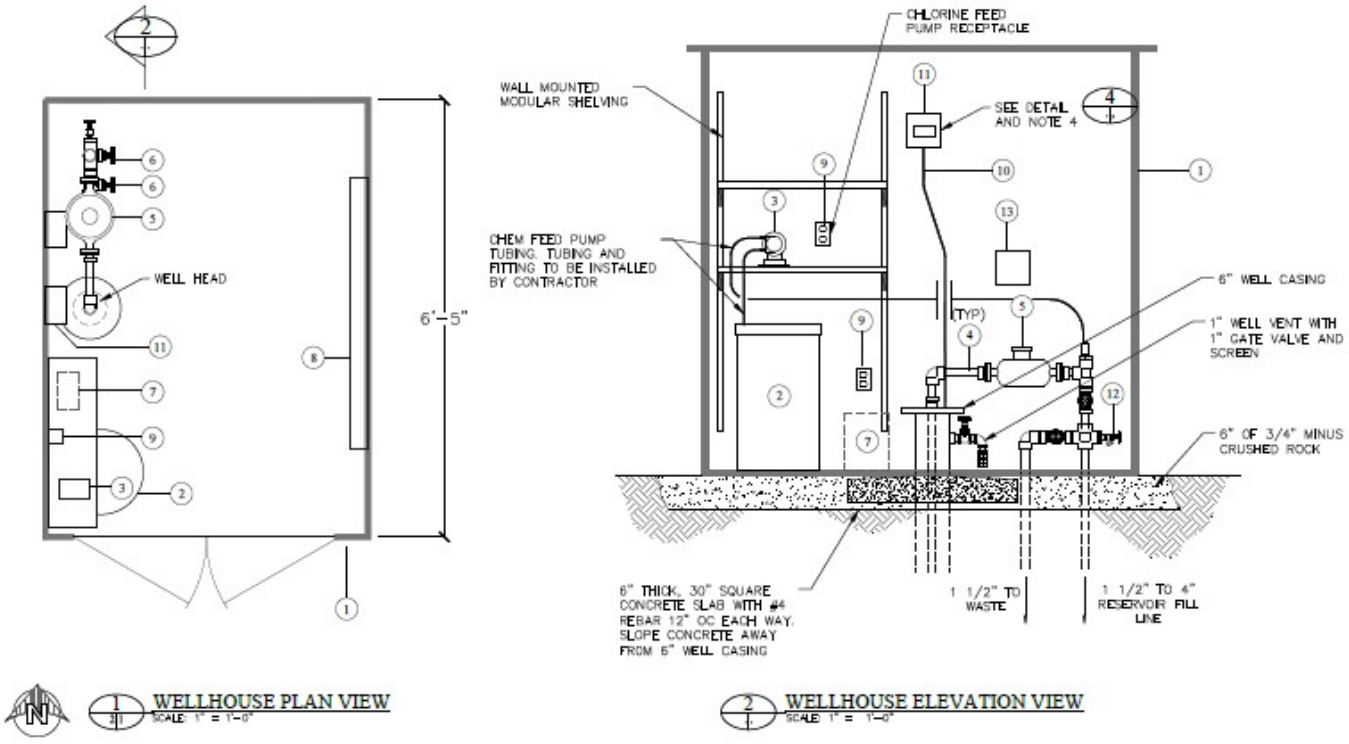
Project Description

The project includes drilling a new well to serve the District as shown below.





APPROXIMATE LOCATION OF NEW WELL LATITUDE: 45.78815° ± LONGITUDE: -123.964701° ±



1/1 WELLHOUSE PLAN VIEW
SCALE: 1" = 1'-0"

2/1 WELLHOUSE ELEVATION VIEW
SCALE: 1" = 1'-0"

MATERIALS

1. SHED: RUBBERMAID MODEL 1967672 57"W X 77.2"L X 76.8H
2. HYPOCHLORITE CHEMICAL TANK
3. HYPOCHLORITE PUMP
4. WATER LINES: 1 1/2" SCH 40 PVC PIPE AND FITTINGS
5. 1 1/2" WATER METER
6. VALVES: 1 1/2" BRASS GATE VALVES
7. PORTABLE HEATER (BY OWNER)
8. 4-TUBE FLUORESCENT LIGHT FIXTURE
9. 120 VAC RECEPTACLES (WIRING BY OWNER)
10. SUBMERSIBLE WELL LEVEL TRANSDUCER
11. WELL LEVEL INDICATOR
12. HOSE BIBB
13. NEMA 4X PLASTIC TELEMETRY J-BOX

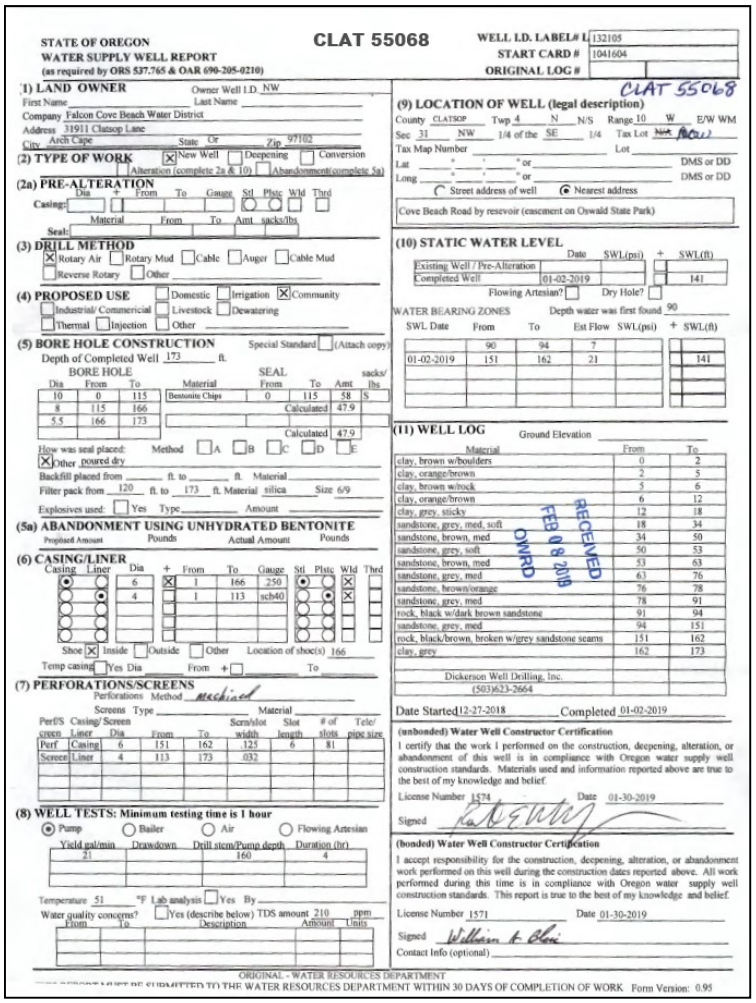
MATERIAL SPECIFICATION

HYPOCHLORITE CHEMICAL FEED PUMP	0.2 – 3.0 GPD, 100 PSI (MAX), 5–100% FLOW RATE ADJUSTMENT, 25 FT SUCTION LIFT, 120 VAC, 60 HZ, POLYCARBONATE HOUSING, SANTOPRENE TUBING, WITH SUCTION AND DISCHARGE TUBING, CONNECTION NUTS, SUCTION STRAINER, AND INJECTION CHECK VALVE. STENNER PUMPS MODEL 45MHP2, OR EQUAL.
CHEMICAL DRUM	15 GALLON CROSS LINKED WHITE POLYETHYLENE CHEMICAL TANK WITH REMOVABLE FLAT LID. SUITABLE FOR 12% SODIUM HYPOCHLORITE SOLUTION STORAGE. NOMINAL DIMENSIONS: 14.5" DIA X 24" HIGH. NSF-61 LISTED
FLOW METER	1 1/2" THREADED CONNECTION WITH ADAPTERS AS NEEDED, FLOW RANGE 2–100 GPM, MAX CONTINUOUS FLOW 50 GPM, GPM MEASUREMENT UNITS, PULSE OUTPUT CONTACTOR 10 GALLONS PER PULSE, THERMOPLASTIC HOUSING, NSF-61 CERTIFICATION. NEPTUNE TECHNOLOGY GROUP T-10 FLOW METER WITH PULSE OUTPUT.

WELL LEVEL DISPLAY	1/8" DIN PANEL METER, 3.5 DIGIT DISPLAY 120 VAC POWER, 4–20 MA EXCITATION INPUT, 2 ALARM RELAY OUTPUTS. DISPLAY TO BE INSTALLED IN MINIMUM 6" X 6" NEMA 4 POLYCARBONATE BOX SUITABLE FOR WALL MOUNTING. OMEGA DP20-A1-A2, OR EQUAL
WELL PRESSURE TRANSDUCER	RANGE 0 –250 FEET, +/–0.25 % ACCURACY, 316SS WETTED PART, 8–28 VDC EXCITATION, OUTPUT 4–20 MA, 2-WIRE, POLYURETHANE CABLE JACKET, WITH ANTI-SNAG CONE AND CABLE HANGER. MEAS KPSI 320 OR EQUAL.
WELL PUMP (EXISTING)	5 HP, 230 VOLT, 1-PHASE, 50 GPM

Geologist Evaluation of the Well Report (adequately constructed into confined aquifer)

The well log (CLAT 55068, Well ID# L132105) shows that the well had been drilled on January 2, 2019. Plans show the well has a 5 HP, 50-gpm submersible pump. The well house is equipped with equipment needed for sodium hypochlorite residual disinfectant treatment and related controls, meters, and valves.



STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

CLAT 55068

WELL I.D. LABEL# L 132105
START CARD # 1041604
ORIGINAL LOG #

(1) LAND OWNER — Owner Well I.D. NW
First Name — Last Name
Company Falcon Cove Beach Water District
Address 31911 Clatsop Lane
City Arch Cape State Or Zip 97102

(2) TYPE OF WORK — [X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (complete 2a & 10) [ ] Abandonment (complete 5a)

(2a) PRE-ALTERATION
Casing: Dia + From To Gauge Stl Plstc Wld Thrd
Material From To Amt sacks/lbs
Seal:

(3) DRILL METHOD
[X] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger [ ] Cable Mud
[ ] Reverse Rotary [ ] Other

(4) PROPOSED USE
[ ] Domestic [ ] Irrigation [X] Community
[ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering
[ ] Thermal [ ] Injection [ ] Other

(5) BORE HOLE CONSTRUCTION — Special Standard [ ] (Attach copy)
Depth of Completed Well 173 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
10	0	115	Bentonite Chips	0	115	58	S
8	115	166			Calculated	47.9	
5.5	166	173			Calculated	47.9	

How was seal placed: Method [ ]A [ ]B [ ]C [ ]D [ ]E
[X] Other poured dry
Backfill placed from ft. to ft. Material
Filter pack from 120 ft. to 173 ft. Material silica Size 6/9
Explosives used: [ ] Yes Type Amount

(5a) ABANDONMENT USING UNHYDRATED BENTONITE
Proposed Amount Pounds Actual Amount Pounds

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
●		6	[X]	1	166	.250	●		[X]	
	●	4		1	113	sch40		●	[X]	

Shoe [X] Inside [ ] Outside [ ] Other Location of shoe(s) 166
Temp casing [ ] Yes Dia From + To

(7) PERFORATIONS/SCREENS
Perforations Method machined
Screens Type Material

Perf/S creen	Casing/ Liner	Screen Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/ pipe size
Perf	Casing	6	151	162	.125	6	81	
Screen	Liner	4	113	173	.032			

(8) WELL TESTS: Minimum testing time is 1 hour
● Pump ○ Bailer ○ Air ○ Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
21		160	4

Temperature 51 °F Lab analysis [ ] Yes By
Water quality concerns? [ ] Yes (describe below) TDS amount 210 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County CLATSOP Twp 4 N N/S Range 10 W E/W WM
Sec 31 NW 1/4 of the SE 1/4 Tax Lot Not Accu
Tax Map Number Lot
Lat ° ' " or DMS or DD
Long ° ' " or DMS or DD
○ Street address of well ● Nearest address
Cove Beach Road by resevoir (easement on Oswald State Park)

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	01-02-2019			141

Flowing Artesian? [ ] Dry Hole? [ ]
WATER BEARING ZONES Depth water was first found 90

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
	90	94	7			
01-02-2019	151	162	21			141

(11) WELL LOG Ground Elevation

Material	From	To
clay, brown w/boulders	0	2
clay, orange/brown	2	5
clay, brown w/rock	5	6
clay, orange/brown	6	12
clay, grey, sticky	12	18
sandstone, grey, med, soft	18	34
sandstone, brown, med	34	50
sandstone, grey, soft	50	53
sandstone, brown, med	53	63
sandstone, grey, med	63	76
sandstone, brown/orange	76	78
sandstone, grey, med	78	91
rock, black w/dark brown sandstone	91	94
sandstone, grey, med	94	151
rock, black/brown, broken w/grey sandstone seams	151	162
clay, grey	162	173

Dickerson Well Drilling, Inc.
(503)623-2664

Date Started 12-27-2018 Completed 01-02-2019

RECEIVED FEB 0 8 2019 OWRD

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
License Number 1574 Date 01-30-2019
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
License Number 1571 Date 01-30-2019
Signed William + Chris
Contact Info (optional)

ORIGINAL - WATER RESOURCES DEPARTMENT
WELL REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK Form Version: 0.95

The proposed site plan was sent to our geologist, Tom Pattee, on 5/9/19. Mr. Pattee evaluated the constructed well and provided the following comments on 5/21/19:

Comments: This well was drilled to a depth of 173 ft. The casing extends to a depth of 166 ft and the casing seal to a depth of 115 ft. The casing seal is completed 21 ft into a 57 ft thick sandstone layer that appears to be of low permeability and is assumed to act as confining layer. Sensitivity Analysis results suggest that the well construction is not sensitive to nearby land use practices.

Nature of Aquifer Evaluation:

Aquifer Nature: ☒ Confined aquifer ☐ Semi-confined aquifer ☐ Unconfined aquifer

Comments: This well draws water from what is interpreted as a thin basalt layer within the surrounding sandstone. The water-bearing zone is directly overlain by 57 ft of sandstone that is assumed to be of low permeability and acts as a confining layer. The static water-level rose from where first encountered in the basalt at 151 ft below ground level to 141 ft below ground level. Sensitivity Analysis result suggest that the aquifer is not highly sensitive to local land use practices.